

**United States Patent** [19]  
**Montgomery**

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[54] **ENZYMATIC POWDER MILK**

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[58] **Field of Search** ..... **426/42, 61, 588, 801, 426/330.3, 334, 335, 63, 64; 424/94; 435/25, 28**

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

2,717,211	11/1952	Cranston	426/61
3,338,719	8/1967	Sawada et al.	426/61
4,150,113	4/1979	Hoogendoorn et al.	424/50
4,178,362	12/1979	Hoogendoorn et al.	424/50
4,269,822	5/1981	Pellico et al.	425/50
4,320,116	3/1982	Björck	424/130
4,537,764	8/1985	Pellico et al.	424/49
4,564,519	1/1986	Pellico et al.	424/50
4,576,816	3/1986	Suganuma et al.	424/50

4,576,817	3/1986	Montgomery et al.	424/130
4,578,265	3/1986	Pellico et al.	424/50

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[57] **ABSTRACT**

Aqueous reconstitutable, powder milk incorporates an enzyme system for providing a bacteriostatic effect upon aqueous reconstitution. The enzyme system contains (a) oxidoreductase enzyme that is hydro-interactable with and specific to oxidizable substrate in the powder milk for producing hydrogen peroxide and (b) peroxidatic peroxidase for interacting with the hydrogen peroxide and oxidizable anion from the powder milk to produce, in the reconstituted milk, oxidized anionic bacterial inhibitor. In an illustrative embodiment, powder milk incorporates (a) glucose oxidase that interacts with glucose in powder milk, upon aqueous dilution, to produce hydrogen peroxide and (b) lactoperoxidase for interacting with hydrogen peroxide and, for example the chloride ion from the powder milk to produce, in the reconstituted milk, the hypochlorite ion, a bacterial inhibitor.

**21 Claims, No Drawings**